HATCHERY AND GENETIC MANAGEMENT PLAN (HGMP)

Hatchery Program:	Voight's Creek Coho Program
Species or Hatchery Stock:	Coho *(Onchorynchus kisutch)* Voight s Creek
Agency/Operator:	Washington Department of Fish and Wildlife
Watershed and Region:	Puyallup River Puget Sound
Date Submitted:	March 17, 2003
Date Last Updated:	March 5, 2003

SECTION 1. GENERAL PROGRAM DESCRIPTION

1.1) Name of hatchery or program.

Voight's Creek Coho Program

1.2) Species and population (or stock) under propagation, and ESA status.

Voight's Creek Coho *(Onchorynchus kisutch)* - not listed

1.3) Responsible organization and individuals

Name (and title):	Chuck Phillips, Region 4 Fish Program Manager Brodie Antipa, Complex Manager	
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Other agencies, Tribes, co-operators, or organizations involved, including contractors, and extent of involvement in the program:

In addition to WDFW's Voight's Creek Hatchery production, fish are transferred to the Puyallup Tribe's acclimation sites (Mowich River and Cow Skull Creek) in the upper Puyallup River to reintroduce coho above Electron Dam. Also, eyed eggs are provided to local schools and Co-ops for rearing and release.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Voight's Creek is funded by the State General Fund. It has 3 permanent employees associated with it. Annual operational costs are approximately $186,000 although this is variable with the fish production goals.

1.5) Location(s) of hatchery and associated facilities.

Voight's Creek Hatchery:	Located at RM 0.5 on Voight's Creek (10.0414), a tributary of the Carbon River (10.0413). Voight's Creek enters the Carbon River at RM 4. The Carbon River is a tributary to the Puyallup River (10.0021) and joins it at RM 17.8.

1.6) Type of program.

Isolated harvest

1.7) Purpose (Goal) of program.

A. Augmentation: The goal of this program is to provide harvest opportunity.

B. Restoration: The goal of this program (see Puyallup Tribe HGMPS) is to reintroduce the closest "local" stock above Electron Dam on the upper Puyallup River.

1.8) Justification for the program.

This program will be operated to provide fish for harvest while minimizing adverse effects on listed fish. This will be accomplished in the following manner:

1. Release coho as smolts with expected brief freshwater residence.

2. Time of release not to coincide with out-migration of listed fish (volitional releases in April and May coincide perfectly with the out-migration of natural coho, cutthroat trout and steelhead).

3. Only appropriate local stock will be propagated.

4. Mark all reared fish.

5. Hatchery fish will be propagated using appropriate fish culture methods and consistent with Co-Managers Fish Health Policy and state and federal water quality standards; e.g. NPDES criteria.

1.9) List of program Performance Standards .

See below.

1.10) List of program Performance Indicators , designated by "benefits" and "risks."

Performance Standards and Indicators for Puget Sound **Integrated Harvest** Coho programs.

Performance Standard	Performance Indicator	Monitoring and Evaluation Plan
Produce adult fish for harvest	Survival and contribution rates	Monitor catch and measuring survivals by periodical CWT data.
Meet hatchery production goals	Number of juvenile fish released - **780,000 on station**	Estimating number of fish planted (weighing / counting fish), monitoring proximity to hatchery production goals, number released recorded on hatchery divisions "plant reports", data available on WDFW data base. Future Brood Documents.
Manage for adequate escapement	Hatchery and wild return rates	Monitoring hatchery/wild return rates through trapping (at the hatchery or at weir), red and snorkel surveys on the spawning grounds plus catch records.

Minimize interactions with listed fish through proper broodstock management	Total number of broodstock collected - **1,100**	Measuring number of fish actually spawned and killed to meet egg take goal at the hatchery. Hatchery Records.
	Sex ratios	Hatchery Records, Spawning Guidelines
	Timing of adult collection/spawning - **mid-October thru mid/late November**	Start trapping prior to historical start of the run, continue trapping throughout the run, dates and times are recorded on hatchery divisions "adult reports", data available on WDFW data base.
	Number of listed fish passed upstream - **unknown, no permanent weir so fish volunteer to trap or go by**	
	Hatchery stray rate	CWT data and spawning ground surveys Hatchery records
	Number wild fish used in broodstock - **Unknown**	
	Return timing of wild/ hatchery adults - **/mid-October thru November**	Hatchery records Hatchery records
	Adherence to spawning guidelines - **see section 8.3**	Spawning Guidelines

Minimize interactions with listed fish through proper rearing and release strategies	Juveniles released as smolts	Future Brood document and Hatchery records
	Out-migration timing of listed fish / hatchery fish - **mid-May (chinook) /April-May (coho)**	Hatchery records and historical natural out-migrant data
	Size and time of release - **17 fpp/April release; 17 fpp/May release (390,000 per release)**	F.D. and Hatchery records
	Hatchery stray rates	CWT data and mark / unmarked ratios of adults
Maintain stock integrity and genetic diversity	Effective population size	Spawning Guidelines
	Hatchery-Origin Recruit spawners	Spawning ground surveys
Maximize in-hatchery survival of broodstock and their progeny; and Limit the impact of pathogens associated with hatchery stocks, on listed fish	Fish pathologists will monitor the health of hatchery stocks on a monthly basis and recommend preventative actions / strategies to maintain fish health	Co-Managers Disease Policy Fish Health monitoring records
	Fish pathologists will diagnose fish health problems and minimize their impact	
	Vaccines will be administered when appropriate to protect fish health	

	A fish health database will be maintained to identify trends in fish health and disease and implement fish health management plans based on findings	
	Fish health staff will present workshops on fish health issues to provide continuing education to hatchery staff.	
Ensure hatchery operations comply with state and federal water quality standards through proper environmental monitoring	NPDES compliance	Monthly NPDES records

1.11) Expected size of program.

1.11.1) Proposed annual broodstock collection level (maximum number of adult fish).

1,100 adults.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location. (*Use standardized life stage definitions by species presented in* Attachment 2).

Life Stage	Release Location	Annual Release Level
Eyed Eggs		
Unfed Fry		
Fry		
Fingering		
Yearling	Voight's Creek (10.0414)	780,000

*- Since 1995 BY, program has been reduced from 1,180,000 released on-station to the present release of 780,000.

**-200,000 fish transferred to the Puyallup tribal acclimation ponds on the upper Puyallup River (Electron Dam) where they reared for several months (2 to 3.5 months) and then released. See section 1.3. Also, approximately 75,000 eggs/fish go to a few schools and co-ops.

1.12) Current program performance, including estimated smolt-to-adult survival rates, adult production levels, and escapement levels. Indicate the source of these data.

Between broodyears 1988 and 1997, the average smolt-to-adult survival rate was 6.07%. The escapement levels back to the hatchery from 1995 through 2001 have been 41,198, 50,649, 18,452, 8,297, 9,005, 39,394 and 34,300, respectively.

1.13) Date program started (years in operation), or is expected to start.

Voight's Creek Hatchery went into coho production in 1917.

1.14) Expected duration of program.

Ongoing

1.15) Watersheds targeted by program.

Puyallup River basin (10)
-Voight's Creek (10.0414)

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

None.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.1) List all ESA permits or authorizations in hand for the hatchery program.

None.

2.2) Provide descriptions, status, and projected take actions and levels for ESA-listed natural populations in the target area.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program.

None.

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

Puyallup River Fall Chinook.

Adults spawn in the mainstream Puyallup River from approximately RM 10.4 upstream to the anadromous barrier at Puget Sound Energy's Electron diversion facility (RM 41.7). Sexually mature fish begin arriving back at the river mouth in late July and continue to enter the river until mid-October. The upstream migration peaks in late August to mid-September. Spawning begins in early September, peaks in early October and is generally complete by November. Fall chinook spawning habitat is available in the Carbon River from its mouth up into Mt. Rainier National Park. Tributary spawning takes place in Clarks Creek, Fennel Creek, Canyon Falls Creek, South Prairie Creek, Wilkes on Creek and Kapowsin Creek.

Most naturally produced Puyallup River chinook migrate to salt water as zero age smelts after spending only a few months in freshwater (Out-migration timing was not currently well defined but a study initiated in 2000 by the Puyallup Tribe, to determine juvenile production levels and migration timing, has indicated that the peak of out-migration occurs in mid-May. Size of the chinook out-migrants at the peak was 80-90 mm). After a few weeks of estuaries acclimation, most juveniles begin moving to near shore feeding grounds in Puget Sound and the Pacific Ocean.

White River Spring Chinook.

Adults spawn in the mainstem White River from the Puget Sound Energy project tailback at Derringer (river mile 3.5) up to the Puget Sound Energy diversion dam at river mile 24.3. Sexually mature fish begin arriving back at the river mouth in May and enter the river through mid-September. Collection and passage (upstream 12 miles) at the Buckley trap commences in late May or early June and ends in early October. Spawning takes

place from early September through mid-October. Tributary spawning takes place in Boise Creek, below the diversion dam, and in the Greenwater River, Clearwater River, Huckleberry Creek and the West Fork White River, all above Mud Mountain Dam.

Like the Puyallup fall chinook, the White River spring chinook juveniles are predominantly zero age out migrants.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- **Describe the status of the listed natural population(s) relative to critical and viable population thresholds** (*see definitions in Attachment 1").*

Critical and viable population thresholds under ESA have not been determined, however, the SARSI report (WDFW) determined both the Puyallup River Fall Chinook and the White River Summer/Fall Chinook populations status to be "unknown". The report determined that the White River Spring Chinook population status was "critical".

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

There is no stock-specific data available to estimate survival or productivity of the natural Puyallup River fall chinook.

Washington run size is not estimated for White River spring chinook and coded-wire-tagging results have not yet provided the stock-specific harvest rate data necessary to calculate adult production rates.

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Estimates of Puyallup River fall chinook spawning naturally in the South Prairie Creek sub-basin[1]

1994	798
1995	1335
1996	1225
1997	622
1998	1028
1999	1422

[1.] Note that the historic Puyallup River fall chinook escapement estimates listed in Run Reconstruction are not considered accurate by the co-managers and are not relative to estimates made by a new method, beginning in 1999. The South Prairie Creek sub-basin has been chosen as an indicator of Puyallup River escapement, with a local spawning objective of 500 adults.

Numbers of adult White River spring chinook passed above Mud Mountain Dam[1] (From Army Corps of Engineers trucking records):

1988	127
1989	83
1990	275
1991	194
1992	406
1993	409
1994	392
1995	605
1996	628
1997	402
1998	320
1999	553

[1.] Note that there are currently no estimates made of spring chinook spawning below the Puget Sound Energy diversion dam at Buckley.

- Provide the most recent 12 year (e.g. 1988-1999) estimates of annual proportions of direct hatchery-origin and listed natural-origin fish on natural spawning grounds, if known.

Puyallup River fall chinook - Unknown. There has been no identification of hatchery-origin fish in this basin until the 1997 brood. Ratios will be developed when these fish mature and return to spawn.

White River spring chinook - Unknown, although only unmarked, untagged fish are trucked above Mud Mountain Dam. This precludes identified hatchery-origin adults from being passed upstream, but unidentified hatchery-origin fish may be in the upper river natural spawning population. 1999 coded-wire-tag recoveries at the Buckley trap/White River Hatchery showed contributions of Squeegeed River spring chinook (released into Tulalip Bay), Fox Island Net Pen fall chinook, Voight's Creek fall chinook, South Sound Net Pen fall chinook, Elliott Bay Net Pen fall chinook, Diru Creek fall chinook and Hoodsport Hatchery fall chinook. All of these strays were removed from the spawning population, however, unmarked elements of these production units (and others) may have been incorporated into the local broodstock, both above and below the barrier.

2.2.3) Describe hatchery activities, including associated monitoring and evaluation and research programs, that may lead to the take of listed fish in the target area, and provide estimated annual levels of take *(see Attachment 1" for definition of take)***.**

- Describe hatchery activities that may lead to the take of listed salmonid populations in the target area, including how, where, and when the takes may occur, the risk potential for their occurrence, and the likely effects of the take.

The release of fish as described in this HGMP could potentially result in ecological interactions with listed species. These potential ecological interactions are discussed in Section 3.5, and risk control measures are discussed in Section 10.11. Implementation of the program modifications provided in this HGMP, and the actions previously taken by the comanagers, are anticipated to contribute to the continued improvement in the abundance of listed salmonids.

The operation of the hatchery gravity intake is not compliant with current intake standards. USFWS has provided funding to WDFW to identify facility modifications to bring the intake into compliance.

- **Provide information regarding past takes associated with the hatchery program, (if known) including numbers taken, and observed injury or mortality levels for listed fish**.

Unknown

- **Provide projected annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program (e.g. capture, handling, tagging, injury, or lethal take).**
*Complete the appended take table (**Table 1**) for this purpose. Provide a range of potential take numbers to account for alternate or worst case scenarios.*

See "take" table

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

NA

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.1) Describe alignment of the hatchery program with any ESU-wide hatchery plan (e.g. *Hood Canal Summer Chum Conservation Initiative*) or other regionally accepted policies (e.g. the NPPC *Annual Production Review* Report and Recommendations - NPPC document 99-15). Explain any proposed deviations from the plan or policies.

None

3.2) List all existing cooperative agreements, memoranda of understanding, memoranda of agreement, or other management plans or court orders under which program operates.

This program is consistent with the Puget Sound Salmon Management Plan (1985).

3.3) Relationship to harvest objectives.

3.3.1) Describe fisheries benefitting from the program, and indicate harvest levels and rates for program-origin fish for the last twelve years (1988-99), if available.

The following mean contribution rates, by fishery, for Voights Creek coho production are based on 32 coded-wire-tagged releases of 1977 through 1989 brood production.

Voights Creek coho yearling releases:

Fishery	Mean Contribution Rate (Catch/yearling released)
Alaskan Fisheries	0.00000
Canadian Fisheries	0.03906
Oregon Fisheries	0.00167
WA Treaty Troll	0.00159
WA Non-treaty Troll	0.00574
WA Ocean Sport	0.00466
PS Net	0.06418
PS Sport	0.00795
Freshwater Sport	0.00019
Total Fishery Contribution	0.12504

This mean contribution rate would estimate a total fishery contribution of 147,547 fish from the current programmed release of 1,180,000 yearlings. The mean harvest rates for these coded-wire-tag releases were 89.9% for all fisheries and 59.1% for Washington fisheries, alone.

The above mean contribution and harvest rates are likely not representative of current rates because there has been a significant reduction in South Sound coho marine survival. The following rates should provide a more representative estimate of Voights Creek fishery contribution, given recent fishery management patterns and those reduced survival rates.

The following contribution rates, by fishery, for Voights Creek coho production are based on coded-wire-tagged releases of 19 brood production.

Voights Creek coho yearling releases:

Fishery	Mean Contribution Rate (Catch/yearling released)
Alaskan Fisheries	0.00000
Canadian Fisheries	0.02060
Oregon Fisheries	0.00006
WA Treaty Troll	0.00017
WA Non-treaty Troll	0.00022
WA Ocean Sport	0.00064
PS Net	0.00788
PS Sport	0.00304
Freshwater Sport	0.00013
Total Fishery Contribution	0.03274

This contribution rate would estimate a total fishery contribution of 38,633 fish from the current programmed release of 1,180,000 yearlings. The mean harvest rate for these coded-wire-tag releases was 43.6% for all fisheries and 32.7% for Washington fisheries, alone.

3.4) Relationship to habitat protection and recovery strategies.

The comanagers resource management plans for artificial production in Puget Sound are expected to be one component of a recovery plan for Puget Sound chinook under development through the Shared Strategy process. Several important analyses have been completed, including the identification of populations of Puget Sound chinook, but further development of the plan may result in an improved understanding of the habitat, harvest, and hatchery actions required for recovery of Puget Sound chinook.

Identified habitat management needs within the Puyallup basin include:

Pursue to completion the fish passage facility at Puget Sound Energy's Electron Dam. Monitor instream flows in the upper Puyallup River to assure that minimum levels are met or exceeded.

Increase the amount of large woody debris in the watershed, maintain wooded riparian zones and enhance vegetation in damaged riparian areas.

Reduce channelization of the Puyallup River and pursue opportunities to develop levee setback projects and reconnect historic meander channels. This would include minimizing "infilling" of floodways and critical habitat with residential development in order to preserve future opportunities.

Reduce the number of logging roads in the watershed and replace culverts that currently block fish passage.

Further limit gravel removal operations in the Puyallup River.

3.5) Ecological interactions.

The program described in this HGMP interacts with the biotic and abiotic components of the freshwater, estuarine, and marine salmonid ecosystem through a complex web of short and longterm processes. The complexity of this web means that secondary or tertiary interactions (both positive and negative) with listed species could occur in multiple time periods, and that evaluation of the net effect can be difficult. WDFW is not aware of any studies that have directly evaluated the ecological effects of this program. Alternatively, we provide in this section a brief summary of empirical information and theoretical analyses of three types of ecological interactions, nutrient enhancement, predation, and competition, that may be relevant to this program. Recent reviews by Fresh (1997), Flagg et al. (2000), and Stockner (2003) can be consulted for additional information; NMFS (2002) provides an extensive review and application to ESA permitting of artificial production programs.

Nutrient Enhancement

Adults originating from this program that return to natural spawning areas may provide a source of nutrients in oligotrohic coastal river systems and stimulate stream productivity. Many watersheds in the Pacific Northwest appear to be nutrient-limited (Gregory et al. 1987; Kline et al. 1997) and salmonid carcasses can be an important source of marine derived nutrients (Levy 1997). Carcasses from returning adult salmon have been found to elevate stream productivity through several pathways, including: 1) the releases of nutrients from decaying carcasses has been observed to stimulate primary productivity (Wipfli et al. 1998); 2) the decaying carcasses have been found to enrich the food base of aquatic invertebrates (Mathisen et al. 1988); and 3) juvenile salmonids have been observed to feed directly on the carcasses (Bilby et al. 1996). Addition of nutrients has been observed to increase the production of salmonids (Slaney and Ward 1993; Slaney et al. 2003; Ward et al. 2003).

Predation Freshwater Environment

Coho and steelhead released from hatchery programs may prey upon listed species of salmonids, but the magnitude of predation will depend upon the characteristic of the listed population of salmonids, the habitat in which the population occurs, and the

characteristics of the hatchery program (e.g., release time, release location, number released, and size of fish released). The site specific nature of predation, and the limited number of empirical studies that have been conducted, make it difficult to predict the predation effects of any specific hatchery program. WDFW is unaware of any studies that have empirically estimated the predation risks to listed species posed by the program described in this HGMP.

In the absence of site-specific empirical information, the identification of risk factors can be a useful tool for reviewing hatchery programs while monitoring and research programs are developed and implemented. Risk factors for evaluating the potential for significant predation include the following:

Environmental Characteristics. Water clarity and temperature, channel size and configuration, and river flow are among the environmental characteristics that can influence the likelihood that predation will occur (see SWIG (1984) for a review). The SIWG (1984) concluded that the potential for predation is greatest in small streams with flow and turbidity conditions conducive to high visibility.

Relative Body Size. The potential for predation is limited by the relative body size of fish released from the program and the size of prey. Generally, salmonid predators are thought to prey on fish approximately 1/3 or less their length (USFWS 1994), although coho salmon have been observed to consume juvenile chinook salmon of up to 46% of their total length (Pearsons et al. 1998). The lengths of juvenile migrant chinook salmon originating from natural production have been monitored in numerous watersheds throughout Puget Sound, including the Skagit River , Stillaguamish River, Bear Creek, Cedar River, Green River, Puyallup River, and Dungeness River. The average size of migrant chinook salmon is typically 40mm or less in February and March, but increases in the period from April through June as emergence is completed and growth commences (Table 3.5.1). Assuming that the prey item can be no greater than 1/3 the length of the predator, Table 3.5.1 can be used to determine the length of predator required to consume a chinook salmon of average length in each time period. The increasing length of natural origin juvenile chinook salmon from March through June indicates that delaying the release hatchery smolts of a fixed size will reduce the risks associated with predation.

Table 3.5.1. Average length by statistical week of natural origin juvenile chinook salmon migrants captured in traps in Puget Sound watersheds. The minimum predator length corresponding to the average length of chinook salmon migrants, assuming that the prey can be no greater than 1/3 the length of the predator, are provided in the final row of the table. (NS: not sampled.)

Watershed	Statistical Week										
	16	17	18	19	20	21	22	23	24	25	26
Skagit [1] 1997-2001	43.2	48.3	50.6	51.7	56.1	59.0	58.0	60.3	61.7	66.5	68.0
Stillaguamish [2] 2001-2002	51.4	53.5	55.7	57.8	60.0	62.1	64.2	66.4	68.5	70.6	72.8
Cedar [3] 1998-2000	54.9	64.2	66.5	70.2	75.3	77.5	80.7	85.5	89.7	99.0	113
Green [4] 2000	52.1	57.2	59.6	63.1	68.1	69.5	NS	79.0	82.4	79.4	76.3
Puyallup [5] 2002	NS	NS	NS	66.2	62.0	70.3	73.7	72.7	78.7	80.0	82.3
Dungeness [6] 1996-1997	NS	NS	NS	NS	NS	NS	NS	NS	77.9	78.8	81.8
All Systems Average Length	50.4	55.8	58.1	61.8	64.3	67.7	69.2	72.8	76.5	79.0	82.4
Minimum Predator Length	153	169	176	187	195	205	210	221	232	239	250

Sources:

[1] Data are from Seiler et al. (1998); Seiler et al. (1999); Seiler et al. (2000); Seiler et al. (2001), and Seiler et al. (2002)..

[2] Data are from regression models presented in Griffith et al. (2001) and Griffith et al. (2003).

[3] Data are from Seiler et al. (2003).

[4] Data are from Seiler et. (2002).

[5] Data are from Samarin and Sebastian (2002).

[6] Data are from Marlowe et al. (2001).

Date of Release. The release date of juvenile fish for the program can influence the likelihood that listed species are encountered or are of a size that is small enough to be consumed. The most extensive studies of the migration timing of naturally produced juvenile chinook salmon in the Puget Sound ESU have been conducted in the Skagit River, Bear Creek, Cedar River, and the Green River. Although distinct differences are evident in the timing of migration between watersheds, several general patterns are beginning to emerge:

1) Emigration occurs over a prolonged period, beginning soon after enough emergence (typically January) and continuing at least until July;
2) Two broad peaks in migration are often present during the January through July time period; an early season peak (typically in March) comprised of relatively small chinook salmon (40-45mm), and a second peak in mid-May to June comprised of larger chinook salmon;
3) On average, over 80% of the juvenile chinook have migrated past the trapping locations after statistical week 23 (usually occurring in the first week of June).

Table 3.5.2. Average cumulative proportion of the total number of natural origin juvenile chinook salmon migrants estimated to have migrated past traps in Puget Sound watersheds.

Watershed	Statistical Week										
	16	17	18	19	20	21	22	23	24	25	26
Skagit [1] 1997-2001	0.61	0.64	0.68	0.73	0.76	0.78	0.83	0.86	0.90	0.92	0.94
Bear [2] 1999-2000	0.26	0.27	0.28	0.32	0.41	0.52	0.73	0.84	0.92	0.96	0.97
Cedar [2] 1999-2000	0.76	0.76	.0.76	0.77	0.79	0.80	0.82	0.84	0.87	0.88	0.90
Green [3] 2000	0.63	0.63	0.64	0.69	0.77	0.79	0.84	0.86	0.88	0.98	1.00
All Systems Average	0.56	0.58	0.59	0.63	0.68	0.72	0.80	0.85	0.89	0.94	0.95

Sources:

[1] Data are from Seiler et al. (1998); Seiler et al. (1999); Seiler et al. (2000); Seiler et al. (2001), and Seiler et al. (2002)..

[2] Data are from Seiler et al. (2003).

[3] Data are from Seiler et. (2002).

Release Location and Release Type. The likelihood of predation may also be affected by the location and type of release. Other factors being equal, the risk of predation may increase with the length of time the fish released from the artificial production program are commingled with the listed species. In the freshwater environment, this is likely to be affected by distribution of the listed species in the watershed, the location of the release, and the speed at which fish released from the program migrate from the watershed.

Coho salmon and steelhead released from western Washington artificial production programs as smolts have typically been found to migrate rapidly downstream. Data from Seiler et al. (1997; 2000) indicate that coho smolts released from the Marblemount Hatchery on the Skagit River migrate approximately 11.2 river miles day. Steelhead smolts released onstation may travel even more rapidly migration rates of approximately 20 river miles per day have been observed in the Cowlitz River (Harza 1998). However, trucking fish to offstation release sites, particularly release sites located outside of the watershed in which the fish have been reared, may slow migrations speeds (Table 3.5.3).

Table 3.5.3. Summary of travel speeds for steelhead smolts for several types of release strategies.

Location	Release Type	Migration Speed (river miles per day)	Source
Cowlitz River	Smolts, onstation	21.3	Harza (1998)
Kalama River	Trucked from facility located within watershed in which fish were released.	4.4	Hulett (pers. comm.)
Bingham Creek	Trucked from facility located outside of watershed in which fish were released.	0.6	Seiler et al. (1997)
Stevens Creek	Trucked from facility located outside of watershed in which fish were released.	0.5	Seiler et al. (1997)
Snow Creek	Trucked from facility located outside of watershed in which fish were released.	0.4	Seiler et al. (1997)

Number Released. Increasing the number of fish released from an artificial production program may increase the risk of predation, although competition between predators for prey may eventually limit the total consumption (Peterman and Gatto 1978).

Predation Marine Environment

WDFW is unaware of any studies that have empirically estimated the predation risks to listed species posed by the program described in this HGMP. NMFS (2002) reviewed existing information on the risks of predation in the marine environment posed by artificial production programs and concluded:

1) Predation by hatchery fish on natural-origin smolts or sub-adults is less likely to occur than predation on fry. Coho and chinook salmon, after entering the marine environment, generally prey upon fish one-half their length or less and consume, on average, fish prey that is less than one-fifth of their length (Brodeur 1991). During early marine life, predation on natural origin chinook, coho, and steelhead will likely be highest in situations where large, yearling-sized hatchery fish encounter sub-yearling fish or fry (SIWG 1984).

2) However, extensive stomach content analysis of coho salmon smolts collected through several studies in marine waters of Puget Sound, Washington do not substantiate any indication of significant predation upon juvenile salmonids (Simenstad and Kinney 1978).

3) Likely reasons for apparent low predation rates on salmon juveniles, including chinook, by larger chinook and other marine predators are described by Cardwell and Fresh (1979). These reasons included: 1) due to rapid growth, fry are better able to elude predators and are accessible to a smaller proportion of predators due to size alone; 2) because fry have dispersed, they are present in low densities relative to other fish and invertebrate prey; and 3) there has either been learning or selection for some predator avoidance.

Competition

WDFW is unaware of any studies that have empirically estimated the competition risks to listed species posed by the program described in this HGMP. Studies conducted in other areas indicate that this program is likely to pose a minimal risk of competition:

1) As discussed above, coho salmon and steelhead released from hatchery programs as smolts typically migrate rapidly downstream. The SIWG (1984) concluded that migrant fish will likely be present for too short a period to compete with resident salmonids.

2) NMFS (2002) noted that ..where interspecific populations have evolved sympatrically, chinook salmon and steelhead have evolved slight differences in habitat use patterns that minimize their interactions with coho salmon (Nilsson 1967; Lister and Genoe 1970; Taylor 1991). Along with the habitat differences exhibited by coho and steelhead, they also show differences in foraging behavior. Peterson (1966) and Johnston (1967) reported that juvenile coho are surface oriented and feed primarily on drifting and flying insects, while steelhead are bottom oriented and feed largely on benthic invertebrates.

3) Flagg et al. (2000) concluded, By definition, hatchery and wild salmonids will not compete unless they require the same limiting resource. Thus, the modern enhancement strategy of releasing salmon and steelhead trout as smolts markedly reduces the potential for hatchery and wild fish to compete for resources in the freshwater rearing environment. Miller (1953), Hochachka (1961), and Reimers (1963), among others, have noted that this potential for competition is further reduced by the fact that many hatchery salmonids have developed different habitat and dietary behavior than wild salmonids. Flagg et al (2000) also stated It is

unclear whether or not hatchery and wild chinook salmon utilize similar or different resources in the estuarine environment.

4) Fresh (1997) noted that Few studies have clearly established the role of competition and predation in anadromous population declines, especially in marine habitats. A major reason for the uncertainty in the available data is the complexity and dynamic nature of competition and predation; a small change in one variable (e.g., prey size) significantly changes outcomes of competition and predation. In addition, large data gaps exist in our understanding of these interactions. For instance, evaluating the impact of introduced fishes is impossible because we do not know which nonnative fishes occur in many salmon-producing watersheds. Most available information is circumstantial. While such information can identify where inter- or intra specific relationships may occur, it does not test mechanisms explaining why observed relations exist. Thus, competition and predation are usually one of several plausible hypotheses explaining observed results.

SECTION 4. WATER SOURCE

4.1) Provide a quantitative and narrative description of the water source (spring, well, surface), water quality profile, and natural limitations to production attributable to the water source.

Voight's Creek Hatchery is supplied by surface water from Voight's Creek. Water is withdrawn from a gravity intake approximately ½ mile upstream from the hatchery. Gravity water is supplemented with water pumped at the hatchery site. The gravity intake supplies 2000 gallons per minute (gpm). The (three) pumps deliver 1,500 gpm each. Voight's Creek responds quickly to heavy rainfall and is prone to rapid fluctuations. Heavy bed loads are due to landslides, timber harvest and watershed development. Winter floods are becoming a common occurrence. Late summer low flows with elevated temperatures into the high 60's have been the norm for several decades. Water withdrawals from the gravity intake divert a significant portion of the creek water from the area immediately below the intake. The screen box bypass channel and a tributary creek rejoin the creek several hundred yards below the intake. The fish ladder is accessible and operational even with the low flows. Natural salmon production is blocked, above RM 4, due to a series of impassable waterfalls.

4.2) Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

Gravity intake screens and ladder are not compliant with code requirements for mesh size and ladder velocity but both are identified for replacement. WDFW has securred 65% / 35% cost share funding from the United States Fish Wildlife Service ($161,956 USFWS / $87,206 WDFW....contract #s 38032261 and 38032259) for the express purpose of beginning the design phase and replacement of the gravity intake and ladder. Chinook have access to the habitat above the gravity intake ladder (three steps) in years of high flow during the time period when adult chinook are returning to Voights Creek. The frequency and number of chinook which access the habitat above the hatchery is directly correlated to the fall flows in Voights' Creek. The pump intake is fitted with "wedge-wire" screening and is compliant with current standards. Hatchery effluent shall meet or exceed NPDES permit standards for discharge of pond cleaning waste or pond drawdown.

SECTION 5. FACILITIES

5.1) Broodstock collection facilities (or methods).

Broodstock are collected in an off-line trap situated alongside Voight's Creek. The trap pond is earthen and measures approximately 30' X 250' The pond doubles as a rearing pond in the spring. Prior to 1996, adults were diverted into the trap pond by a permanent rack in Voight's Creek. Since 1996, the rack has been inoperative due to gravel deposition. Returning adults enter the trap pond volitionally at this time.

5.2) Fish transportation equipment (description of pen, tank truck, or container used).

Fish hauls utilize fish tanker trucks of 500 to 2,000 gallon capacity equipped with water pumps and oxygen tanks.

5.3) Broodstock holding and spawning facilities.

Broodstock are held in a large earthen pond. Adults are seined, sorted, killed and spawned at pondside.

5.4) Incubation facilities.

Incubation utilizes 68 vertical Heath Techna incubators with the eyeing capacity of 11 million eggs and the hatching capacity of 5.5 million salmon.

5.5) Rearing facilities.

The facility utilizes 9 "standard" concrete rearing ponds, two 1/4 acre asphalt ponds and one large earthen pond (also used to trap adults).

5.6) Acclimation/release facilities.

Fish are reared on ambient surface water of Voight's Creek.

5.7) Describe operational difficulties or disasters that led to significant fish mortality.

In the past 12 years:

1. Heavy debris loads cause the gravity intake screens to become plugged frequently. This, coupled with a faulty alarm unit, caused the loss of 100,000 yearling coho in November, 1999.

2. Flood conditions in February 1996 caused the suffocation loss of several hundred thousand coho sac-fry yet in the incubators. The same flood caused the premature release of an unknown number (>50K) of yearling coho.

3. Occasionally, water orifices which supply individual vertical incubators will plug with debris causing the loss of complete vertical stacks of eggs or fry.

5.8) Indicate available back-up systems, and risk aversion measures that will be applied, that minimize the likelihood for the take of listed natural fish that may result from equipment failure, water loss, flooding, disease transmission, or other events that could lead to injury or mortality.

The hatchery is equipped with a backup generator and adequate fuel supply in the event of a power outage. Two on-site personnel are on rotating standby status year around in the event of a problem. An upgraded alarm system is designed to detect changes in flow and power status. The risk of disease transmission shall be limited by using effective theraputents, as prescribed and in a timely manner.

SECTION 6. BROODSTOCK ORIGIN AND IDENTITY

Describe the origin and identity of broodstock used in the program, its ESA-listing status, annual collection goals, and relationship to wild fish of the same species/population.

6.1) Source.

Adult returns to the hatchery. Prior to 1996, adults were diverted into the trap pond by a permanent rack in Voight's Creek. Since 1996, the rack has been inoperative due to gravel deposition. Returning adults enter the trap pond volitionally at this time.

6.2) Supporting information.

6.2.1) History.

The hatchery returns represent a composite of local and introduced stocks with native origin stock predominating. Voight's Creek stock coho are considered unique in the Puget Sound hatchery system. They are a fairly early returning/spawning stock. Every third year the returns are slightly earlier than the other two years.

6.2.2) Annual size.

1,100 adults needed for eggtake purposes (550 females and 550 males). The run size has ranged from 8,000 to 52,000 the last 10 years. Only fish that have a adipose-fin clip are used for spawning purposes.

6.2.3) Past and proposed level of natural fish in broodstock.

Unknown

6.2.4) Genetic or ecological differences.

In Voights' Creek there are no known differences. Excess hatchery stock have, for many decades, populated the creek above the hatchery, having achieved access during floods. They are believed to be largely of hatchery origin. The similarity/difference to other Puyallup basin coho is unknown.

6.2.5) Reasons for choosing.

The stock of coho used at Voights Creek is described as native.

6.3) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish that may occur as a result of broodstock selection practices.

NA

SECTION 7. BROODSTOCK COLLECTION

7.1) Life-history stage to be collected (adults, eggs, or juveniles).

Adults

7.2) Collection or sampling design.

Returning adults are trapped, volitionally, in an off-creek trap. An instream weir has been inoperative since 1996. It will eventually be replaced. With a weir, trap efficiency is 80-90%. Without a weir, trap efficiency is 70-80%. Peak returns are mid-October to early November. Spawning is in mid-November.

7.3) Identity.

All coho have been 100% identified with an adipose-fin clip (mass marked).

7.4) Proposed number to be collected:

7.4.1) Program goal (assuming 1:1 sex ratio for adults):

1,100 (550 females:550 males).

7.4.2) Broodstock collection levels for the last twelve years (e.g. 1988-99), or for most recent years available:

Year	Adults			Eggs	Juveniles
	Females	Males	Jacks		
1988					
1989					
1990					
1991					
1992					
1993					
1994					
1995	2,320	3,318	695	3,375,000	
1996	1,483	1,859	13	2,205,500	
1997	1,447	1,416	2	2,014,000	
1998	1,281	1,331	5	1,993,200	
1999	991	1,012	4	1,803,400	
2000	898	899	1	1,945,300	
2001	621	622		1,428,700	

Data source: Voight's Creek hatchery records

7.5) Disposition of hatchery-origin fish collected in surplus of broodstock needs.

Surplus fish are available for a number of uses. Many are donated to food banks while some are used for nutrient enhancement. Some are used to provide additional recreational fishing opportunity in local lakes. The remainder are sold to a contract buyer for various purposes.

7.6) Fish transportation and holding methods.

Fish are hauled in 300 to 1800 gallon tankers equipped with re-circulation pumps and oxygen.

7.7) Describe fish health maintenance and sanitation procedures applied.

Standard fish health protocols are followed, as defined in the Co-Manager Fish Health Manual (WDFW 1996). Kidney-spleen samples are analyzed for presence of disease. Ovarian fluid samples are taken for viral analyses. Eggs are water hardened in iodophor solution.

7.8) Disposition of carcasses.

Carcasses are often sold to a fish buyer. Some carcasses are used for nutrient enhancement projects.

7.9) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the broodstock collection program.

NA

SECTION 8. MATING

Describe fish mating procedures that will be used, including those applied to meet performance indicators identified previously.

8.1) Selection method.

Adults are chosen randomly over the entire run and used for spawning purposes based on ripeness. Spawning days are scheduled to match run timing. If female numbers exceed daily hatchery egg take needs, females are surplused or removed from the breeding population to ensure that the later part of the run is represented.

8.2) Males.

Males are selected randomly. One male is used for each female in paired matings. No backups are used unless a male has poor or watery sperm. Approximately 1% of the males used are jacks.

8.3) Fertilization.

The mating ratio is 1:1 and gametes from five fish pools. If a male killed for spawning is not fully ripe or has very little milt, then another male is used to assure fertilization of the eggs. They are transported to the hatchery for disinfection (iodophor solution) and water hardening (30-60 seconds).

8.4) Cryopreserved gametes.

None

8.5) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic or ecological effects to listed natural fish resulting from the mating scheme.

NA

SECTION 9. INCUBATION AND REARING -

Specify any management *goals* (e.g. egg to smolt survival) that the hatchery is currently operating under for the hatchery stock in the appropriate sections below. Provide data on the success of meeting the desired hatchery goals.

9.1) Incubation:

9.1.1) Number of eggs taken and survival rates to eye-up and/or ponding.

Eggs taken have ranged between 3.3 and 13.7 million. For BY 2002, the egg take goal is 1.4 million. Survival to eye up is typically 90%.

9.1.2) Cause for, and disposition of surplus egg takes.

Surplus eggs have been sold in past years, although this practice no longer occurs. In recent years an emphasis has been placed on not exceeding program egg take and smolt release goals.

9.1.3) Loading densities applied during incubation.

Vertical stack incubators are loaded with 10,000-12,000 eggs per tray at a flow of 4 gpm.

9.1.4) Incubation conditions.

Eggs are incubated in surface water at ambient temperatures. Voight's Creek is frequently cold and silty in the winter months and continued checking and cleaning is required to prevent suffocation from silt buildup. Water temperatures in the low 30s are common.

9.1.5) Ponding.

Ponding occurs when the fry have achieved 95% or greater button-up status. Ponding is forced and typically occurs between the end of December and the end of January.

9.1.6) Fish health maintenance and monitoring.

Eggs are treated with a routine regimen of formalin drips treatments (1:800 parts per million) to prevent fungus growth. Eggs are shocked and picked with an electronic egg picker to remove non-viable eggs.

9.1.7) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish during incubation.

NA

9.2) Rearing:

9.2.1) Provide survival rate data (*average program performance*) by hatchery life stage (fry to fingerling; fingerling to smolt) for the most recent twelve years (1988-99), or for years dependable data are available..

Fry to smolt survival averages around 76.6%.

9.2.2) Density and loading criteria (goals and actual levels).

Fish culture parameters conform to those set out in Fish Hatchery Management (Piper, 1982). Maximum loading goals, in terms of pounds of fish per gallon per minute at release, equates to 1.5 x fish length in inches. Maximum densities, in terms of lbs/cubic foot of rearing space, equates to .3 x fish length in inches. Effort is made to utilize pond space so densities can be kept as low as possible.

9.2.3) Fish rearing conditions

All ponds receive ambient water from Voight's Creek. Incoming oxygen levels are saturated, but are not normally monitored. Due to heavy silt loads the ponds are vacuumed frequently (weekly or as-needed).

9.2.4) Indicate biweekly or monthly fish growth information (*average program performance*), including length, weight, and condition factor data collected during rearing, if available.

Not available.

9.2.5) Indicate monthly fish growth rate and energy reserve data (*average program performance*), if available.

Not available.

9.2.6) Indicate food type used, daily application schedule, feeding rate range (e.g. % B.W./day and lbs/gpm inflow), and estimates of total food conversion efficiency during rearing (*average program performance*).

Fish are fed a dry diet throughout the rearing term. Initial feeding rates are normally around 3% B.W./day, maintenance feeding rates during late fall and winter are .5 to 1% B.W./day. Generally conversion rates are 1:1 (range from .7 to 1.3) depending on the type of diet.

9.2.7) Fish health monitoring, disease treatment, and sanitation procedures.

Ponds are vacuumed weekly or as-needed. Fish Health Specialists make scheduled visits to check on fish health. Medications or alternate management plans derive from these checks. When emptied, all ponds are cleaned, air dried and sun-sanitized, if possible.

9.2.8) Smolt development indices (e.g. gill ATPase activity), if applicable.

NA

9.2.9) Indicate the use of "natural" rearing methods as applied in the program.

None

9.2.10) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish under propagation.

NA

SECTION 10. RELEASE

Describe fish release levels, and release practices applied through the hatchery program.

Specify any management goals (e.g. number, size or age at release, population uniformity, residualization controls) that the hatchery is operating under for the hatchery stock in the appropriate sections below.

10.1) Proposed fish release levels. *(Use standardized life stage definitions by species presented in **Attachment 2**. Location is watershed planted (e.g. Elwha River).)*

Age Class	Maximum Number	Size (fpp)	Release Date	Location
Eggs				
Unfed Fry				
Fry				
Fingerling				
Yearling	390,000	17	April	Voight's Creek
	390,000	17	May	Voight's Creek

10.2) Specific location(s) of proposed release(s).

Stream, river, or watercourse: Voight's Creek (10.0414)
Release point: Voight's Creek (RM 0.5)
Major watershed: Puyallup River (10.0021)
Basin or Region: Puget Sound

10.3) Actual numbers and sizes of fish released by age class through the program.
For existing programs, provide fish release number and size data for the past three fish generations, or approximately the past 12 years, if available. Use standardized life stage definitions by species presented in ***Attachment 2****. Cite the data source for this information.*

Release year	Eggs/ Unfed Fry	Avg size	Fry	Avg size	Fingerling	Avg size	Yearling	Avg size
1988								
1989								
1990								
1991								
1992								
1993								
1994								
1995			993,000	1,500	602,098	478	1,318,745	18
1996					275,400	456	1,136,300 50,000	17 29
1997					275,000	460	1,228,000	19
1998					110,000	160	995,500	18
1999							1,129,000	20
2000							1,126,800	18
2001							1,194,826	19
Average			993,000	1,500	315,624	389	1,022,396	20

Data source: Voights Cr. hatchery records

10.4) Actual dates of release and description of release protocols.

Yearlings are released between April 10 and May 10. Fish are released volitionally for several weeks and then forced at the end of the release cycle. Program has been reduced to an on-station release of 780,000 from an 1,180,000 release.

10.5) Fish transportation procedures, if applicable.

All facility programmed smolts are released on-station. Fish destined for the Upper Puyallup are hauled in tribal tank trucks (see Puyallup Tribal HGMP's).

10.6) Acclimation procedures .

Reared on ambient Voight's Creek surface water their entire life.

10.7) Marks applied, and proportions of the total hatchery population marked, to identify hatchery adults.

One 45,000 tag index group is coded-wire tagged only with no adipose clip. The remainder of the station production (96.2%) is adipose clipped.

10.8) Disposition plans for fish identified at the time of release as surplus to programmed or approved levels.

There are none. Any surplus is identified at the time of clipping and they are disposed of at that time.

10.9) Fish health certification procedures applied pre-release.

Fish are examined by a WDFW Fish Health Specialist prior to release or transfer, in accordance with the Co-Managers Salmonid Disease Policy.

10.10) Emergency release procedures in response to flooding or water system failure.

Dependent on the situation, generally, fish with the highest likelihood of surviving to adulthood are released first. Backup pumps can be used to supply water in case of emergency.

10.11) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

To minimize the risk of residualization and impact upon natural fish, hatchery yearlings are released in April and May as smolts. The turbidity of the Puyallup River is likely to reduce the risks of predation posed by this program..

SECTION 11. MONITORING AND EVALUATION OF PERFORMANCE INDICATORS

11.1) Monitoring and evaluation of Performance Indicators presented in Section 1.10.

11.1.1) Describe plans and methods proposed to collect data necessary to respond to each Performance Indicator identified for the program.

The comanagers conduct numerous ongoing monitor programs, including catch, escapement, marking, tagging, and fish health testing. The focus of enhanced monitoring and evaluation programs will be on the risks posed by ecological interactions with listed species. WDFW is proceeding on four tracks:

1) An ongoing research program conducted by Duffy et al. (2002) is assessing the nearshore distribution, size structure, and trophic interactions of juvenile salmon, and potential predators and competitors, in northern and southern Puget Sound. Funding is provided through the federal Hatchery Scientific Review Group.

2) A three year study of the estuarine and early marine use of Sinclair Inlet by juvenile salmonids is nearing completion. The project has four objectives:

a) Assess the spatial and temporal use of littoral habitats by juvenile chinook throughout the time these fish are available in the inlet;

b) Assess the use of offshore (i.e., non-littoral) habitats by juvenile chinook;

c) Determine how long cohorts of juvenile chinook salmon are present in Sinclair inlet;

d) Examine the trophic ecology of juvenile chinook in Sinclair Inlet. This will consist of evaluating the diets of wild chinook salmon and some of their potential predators and competitors. Funding is provided by the USDD-Navy.

3) WDFW is developing the design for a research project to assess the risks of predation on listed species by coho salmon and steelhead released from artificial production programs. Questions which this project will address include:

a) How does trucking and the source of fish (within watershed or out of watershed) affect the migration rate of juvenile steelhead?

b) How many juvenile chinook salmon of natural origin do coho salmon and steelhead consume?

c) What is the rate of residualism of steelhead in Puget Sound rivers?

Funding needs have not yet been quanitifed, but would likely be met through a combination of federal and state sources.

4) WDFW is assisting the Hatchery Scientific Review Group in the development of a template for a regional monitoring plan. The template will provide an integrated assessment of hatchery and wild populations.

11.1.2) Indicate whether funding, staffing, and other support logistics are available or committed to allow implementation of the monitoring and evaluation program.

See Section 11.1.1.

11.2) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

Risk aversion measures will be developed in conjunction with the monitoring and evaluation plans.

SECTION 12. RESEARCH

12.1) Objective or purpose.

There is currently no research being conducted using Voights Creek Coho.

12.2) Cooperating and funding agencies.

12.3) Principle investigator or project supervisor and staff.

12.4) Status of stock, particularly the group affected by project, if different than the stock(s) described in Section 2.

12.5) Techniques: include capture methods, drugs, samples collected, tags applied.

12.6) Dates or time period in which research activity occurs.

12.7) Care and maintenance of live fish or eggs, holding duration, transport methods.

12.8) Expected type and effects of take and potential for injury or mortality.

12.9) Level of take of listed fish: number or range of fish handled, injured, or killed by sex, age, or size, if not already indicated in Section 2 and the attached take table (Table 1).

12.10) Alternative methods to achieve project objectives.

12.11) List species similar or related to the threatened species; provide number and causes of mortality related to this research project.

12.12) Indicate risk aversion measures that will be applied to minimize the likelihood for adverse ecological effects, injury, or mortality to listed fish as a result of the proposed research activities.

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SECTION 14. CERTIFICATION LANGUAGE AND SIGNATURE OF RESPONSIBLE PARTY

I hereby certify that the foregoing information is complete, true and correct to the best of my knowledge and belief. I understand that the information provided in this HGMPS is submitted for the purpose of receiving limits from take prohibitions specified under the Endangered Species Act of 1973 (16 U.S.C.1531-1543) and regulations promulgated thereafter for the proposed hatchery program, and that any false statement may subject me to the criminal penalties of 18 U.S.C. 1001, or penalties provided under the Endangered Species Act of 1973.

Name, Title, and Signature of Applicant:

Certified by_____ Date:_____

Table 1. Estimated listed salmonid take levels of by hatchery activity.

Listed species affected: Chinook ESU/Population: Puget Sound Activity: Hatchery Operations				
Location of hatchery activity: Voight's Creek Dates of activity: October-September Hatchery program operator: WDFW				
Type of Take	**Annual Take of Listed Fish By Life Stage *(Number of Fish)***			
	Egg/Fry	Juvenile/Smolt	Adult	Carcass
Observe or harass a)				
Collect for transport b)				
Capture, handle, and release c)			Unknown	
Capture, handle, tag/mark/tissue sample, and release d)				
Removal (e.g. broodstock) e)				
Intentional lethal take f)				
Unintentional lethal take g)	Unknown	Unknown	Unknown	
Other Take (specify) h)				

a. Contact with listed fish through stream surveys, carcass and mark recovery projects, or migrational delay at weirs.
b. Take associated with weir or trapping operations where listed fish are captured and transported for release.
c. Take associated with weir or trapping operations where listed fish are captured, handled and released upstream or downstream.
d. Take occurring due to tagging and/or bio-sampling of fish collected through trapping operations prior to upstream or downstream release, or through carcass recovery programs.
e. Listed fish removed from the wild and collected for use as broodstock.
f. Intentional mortality of listed fish, usually as a result of spawning as broodstock.
g. Unintentional mortality of listed fish, including loss of fish during transport or holding prior to spawning or prior to release into the wild, or, for integrated programs, mortalities during incubation and rearing.
h. Other takes not identified above as a category.

Instructions:

1. An entry for a fish to be taken should be in the take category that describes the greatest impact.
2. Each take to be entered in the table should be in one take category only (there should not be more than one entry for the same sampling event).
3. If an individual fish is to be taken more than once on separate occasions, each take must be entered in the take table.